CLAIMS

What is claimed is:

1. A modular operating topology element (MOTE) within a miniaturized package, comprising:

a central processing unit (CPU);

an internal hardware bus connected to said central processing unit;

a non-volatile RAM connected to said hardware bus and accessible by said CPU;

a non-volatile ROM connected to said hardware bus and accessible by said CPU;

a battery-backed real time clock-calendar unit connected to said hardware bus for providing time and date information to said CPU;

an interrupt control module connected to said hardware bus and operating as an interrupt monitor for prompting various operating states of said CPU; and

a host bus I/O module for connecting said internal hardware bus to a prevailing standard host external bus;

wherein the RAM space is managed by said CPU as workspace memory and as a virtual passive mass storage as seen by the host external bus under interrupt-driven multiprogramming within the MOTE.

2. The element of claim 1 also including a peripheral device I/O module for interconnecting optional peripheral devices to said internal hardware bus.

3. The elements of claim 1 when physically combined in a sealed unit with a form factor meeting the prevailing standards for physical and electronic interfacing compatible with modular mass storage units.

4. The elements of claim 2 when physically combined in a sealed unit with a form factor meeting the prevailing standards for physical and electronic interfacing compatible with modular mass storage units.

5. The element of claim 1 wherein control software resident in said ROM and RAM implement a non-hierarchical lattice topology of parallel and concurrent logical processes on a software (logical) bus for partitioning the functions running on said CPU and for managing logical priority queues of messages for said logical processes.

6. The element of claim 5 wherein said element is capable of connection to a prevailing standard external bus for acting as an extended mass storage volume to host equipment connected to said external bus.

7. The element of claim 5 wherein said ROM includes an internal flow control program for managing the shared use of said RAM and the operating state of said CPU, including a software implemented event manager, for directing the operation of said CPU in the presence of signals from said interrupt control module.

8. The element of claim 7 wherein said internal flow control program includes an event manager software controller for determining a power fail interrupt and directing the CPU to save status in the presence thereof, and for determining between a plurality of other interrupt instructions and signaling various CPU processing states as a function thereof.

9. The element of claim 8 wherein said plurality of interrupt instructions determined by said event manager includes: an I/O interrupt signal, a processing timeslice expiration signal, a logical bus message, a real time clock interrupt, a process control relinquishment instruction, and a watchdog timeout or malfunction signal.

10 The element of claim 7 wherein said CPU manages access to said non-volatile RAM storage for the transfer of data to and from said RAM wherein said CPU operation

provides to an external host a virtual passive mass storage which emulates the appearance of PCMCIA, CF, and other passive mass storage volumes in a prevailing format.

11. The element of claim 10 wherein said CPU management of said non-volatile RAM storage permits access to RAM storage first on the basis of it being a valid virtual mass storage control address and second on the basis of it being a valid address within a file or directory active and/or authorized for access by the host.

12. The element of claim 11 also operating within a soft lattice topology of a plurality of such elements interconnected by a software bus, said element being programmed to be dedicated to a selected specialized program function.

13. The element of claim 12 wherein said element is re-programmable to re-configure its program function.

14. The element of claim 13 wherein said re-programming also includes making said element non-functional.

15. A connection network forming a software lattice topology for the operation of identical computing elements in connection with host equipment, comprising: a plurality of Modular Operating Topology Elements (MOTEs) each containing a central processing unit and internal hardware bus, a non-volatile RAM connected to said internal hardware bus and accessible under the exclusive control of said CPU, a non-volatile ROM connected to said internal hardware bus and accessible exclusively by said CPU, a battery-backed real time clock-calendar unit connected to said internal hardware bus and providing time and date information to said CPU, an interrupt control module connected to said internal hardware bus and providing status signals to said CPU, and one or more optional peripheral I/O interfaces providing access to said internal hardware bus, wherein said interrupt control module operates with said CPU to independently

control the ultra-concurrent and ultra-modular logical processing of operations within each said topology element, and wherein said CPU controls the access to said RAM to project virtual passive mass storage to said I/O connection; wherein a plurality of said topology elements are each programmed with a specific logical queue address for receiving logical messages and to perform a specific system support or end-user application function.

16. The network of claim 15 wherein any of said topology elements may be selectively programmed to be operative and non-operative to reconfigure and rescale said soft-latticed network.

17. The network of claim 16 wherein said reconfiguration includes reprogramming individual element computing functions.

18. The element of claim 1 wherein said modular operating topology element with its said self-contained CPU and memory and operating system software and end-user application(s) serves as a means for partitioning functionality and for reducing the computing load for attached host equipment.

19. The element of claim 1 wherein said modular operating topology element (MOTE) with its said self-contained CPU and memory and operating system software and end-user application(s) serves as a means for distributing proprietary software and computing services with minimal exposure to illegal copying, tampering, and other misuse.

20. The element of claim 3 wherein said modular operating topology element (MOTE) with its said self-contained CPU and memory and operating system software and end-user application(s) serves as a means for distributing proprietary software and computing services with minimal exposure to illegal copying, tampering, and other misuse.

21. The element of claim 1 wherein said modular operating topology element with its said self-contained CPU and memory and operating system software and end-user application(s) serves as a means to isolate its self-contained functionality from changes in host hardware, host operating systems, and other software in attached host equipment and to provide said functionality in highly compatible physical and electronic packaging ready for use with only minimal installation procedures.

22. The network claim 15 wherein said modular operating topology element with its said self-contained CPU and memory and operating system software and end-user application(s) serves as a means for partitioning functionality and for reducing the computing load for attached host equipment.

23. The network of claim 15 wherein said modular operating topology element (MOTE) with its said self-contained CPU and memory and operating system software and end-user application(s) serves as a means for distributing proprietary software and computing services with minimal exposure to illegal copying, tampering, and other misuse.

24. The network of claim 15 wherein said modular operating topology element with its said self-contained CPU and memory and operating system software and end-user application(s) serves as a means to isolate its self-contained functionality from changes in host hardware, host operating systems, and other software in attached host equipment and to provide said functionality in highly compatible physical and electronic packaging ready for use with only minimal installation procedures.